

CLAIMS

1. A modular system for constructing substantially rigid structures from polystyrene materials comprising:

5 a set of building panels, of predetermined shape, the panels configured to define a structure when the panels are arranged and aligned together in accord with an instruction;

10 a plurality of predefined interlock slots formed into each panel and disposed at panel locations at which panels are to be aligned in order to define a structure, an interlock slot of a first panel being juxtaposed, in face-to-face manner, with an interlock slot of a second panel when the panels are arranged and aligned together in accord
15 with the instruction;

a plurality of interlock keys, configured for friction fit insertion into the juxtaposed interlock slots, the interlock keys spanning the interlock slots of two panels so as to further align the panels and substantially lock
20 said panels together at the key/slot joint; and

wherein the building panels, interlock slots and interlock keys are formed from polystyrene foam material so as to define a structure with use of adhesives or conventional fasteners.

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2. The modular construction system according to claim 1, wherein interlock slots are formed as female-type, dove-tail slots having predefined lateral dimensions.

3. The modular construction system according to claim 2, wherein interlock keys are formed as male-type dove-tail, members having predefined lateral dimensions oversized from the predefined lateral dimensions of the interlock slots.

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4. The modular construction system according to claim 3, wherein the predefined lateral dimensions of the slots and keys comprise the spacing between opposing angled sidewalls.

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5. The modular construction system according to claim 4, wherein the spacing between opposing angled sidewalls of an interlock key is oversized to the spacing between opposing angled sidewalls of an interlock slot by an amount ranging from about 0.005 inches to about 0.007 inches.

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6. The modular construction system according to claim 5, wherein two building panels are joined together at abutting edges by an interlock key having two adjoining joint members, disposed in opposing relationship, each joint member insertable in a respective panel's interlock slot, so as to lock the panels together in an edge-to-edge relationship.

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7. The modular construction system according to claim 5, wherein two building panels are joined together along contiguous faces by an interlock key defining a single joint member, the joint member insertable in a respective panel's interlock slot and spanning a contiguous slot

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defined by adjoining panels, so as to lock the panels together along their faces.

8. The modular construction system according to claim 5,
5 wherein an interlock key comprises a multiplicity of joint members, disposed at angles with respect to one another such that panels are joined together in accord with the angles of the joint members.

10 9. In a modular construction system, a method for fitting together building elements formed from polystyrene foam in a manner providing structural rigidity sufficient for light duty structures or enclosures, the method comprising:

defining a set of building panels, of predetermined
15 shape, the panels configured to define a structure when the panels are arranged and aligned together;

forming a plurality of predefined interlock slots into each panel at particular panel locations at which panels are to be joined together in order to define a structure;

20 aligning at least a first and second panel together so as to juxtapose respective interlock slots with one another; and

spanning the juxtaposed interlock slots of two panels with at least one interlock key, the key configured for
25 friction fit insertion into the juxtaposed interlock slots, the interlock key further aligning the panels and substantially locking said panels together at the key/slot joint.

10. The method according to claim 9, wherein two building panels are joined together at abutting edges by an interlock key having two adjoining joint members, disposed in a "butterfly" relationship, each joint member insertable
5 in a respective panel's interlock slot, so as to lock the panels together in an edge-to-edge relationship.

11. The method according to claim 9, wherein two building panels are joined together along contiguous faces by an
10 interlock key defining a single joint member, the joint member insertable in each respective panel's interlock slot and spanning a contiguous slot defined by adjoining panels, so as to lock the panels together along their faces.

12. The method according to claim 9, wherein an interlock slot further comprises a trapezoidal channel having a floor or bottom, an opening or throat and two opposing angled sides such that the width dimension of the channel floor is larger than the width dimension of the channel throat.

20 13. The method according to claim 12, wherein an interlock key comprises a trapezoidal member having a shape conforming to the shape of the channel, and wherein the interlock key has width dimensions at its respective angled
25 sides oversized from the width dimensions of a respective slot's angled sides, such that insertion of a key into a corresponding slot defines a surface friction force at adjoining angled side surface interfaces.

14. The method according to claim 13, wherein the angled sides of the interlock slots and keys cooperate to define a locking force along the length of adjoining angled sides as the key is inserted into a corresponding slot, the locking
5 force directed towards an interlock channel floor, thereby exerting a pulling force on an interlock key and encouraging a further frictional fit bond between a slot and a key along the channel floor.

10 15. The method according to claim 14, wherein two building panels are joined together at abutting edges by an interlock key having two opposed joint members, configured in a "butterfly" relationship, each joint member insertable in a respective panel's interlock slot, so as to lock the
15 panels together in an edge-to-edge relationship.

16. A modular building system for constructing substantially rigid structures from polystyrene elements without use of adhesives or fasteners, the system
20 comprising:

a set of building panel components, the panel components sized and shaped to define a structure when arranged and aligned together, horizontally and vertically;

a plurality of interlock joints of a first type formed
25 into each panel and disposed at panel locations at which particular panels are to be joined together in order to define a structure; and

a plurality of interlock joints of a second type, configured for friction fit insertion with respect to the
30 interlock joints of the first type, the first and second

interlock joint types cooperating to substantially lock said panels together at the joint.

17. The building system according to claim 16, wherein the
5 interlock joints of a first type comprise a regular trapezoidal channel including a floor having a first width, a throat opening having a second, smaller, width, and two angled sides.

10 18. The building system according to claim 17, wherein the interlock joints of a second type comprise a regular trapezoidal member configured for insertion into the regular trapezoidal channel, the member including a side
15 corresponding to the channel floor having a first width, a side corresponding to the channel throat opening having a second, smaller, width, and two angled sides, the widths of the trapezoidal member being larger than the corresponding widths of the trapezoidal channel by from about 0.005
20 inches to about 0.007 inches.

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19. The building system according to claim 18, wherein insertion of a key into a corresponding slot defines a surface friction force at adjoining angled side surface
25 interfaces.

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20. The building system according to claim 19, wherein the angled sides of the interlock slots and keys cooperate to define a locking force along the length of adjoining angled sides as the key is inserted into a corresponding
30 slot, the locking force directed towards an interlock

channel floor, thereby exerting a pulling force on an interlock key and encouraging a further frictional fit bond between a slot and a key along the channel floor.

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